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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,027	12/04/2003	Angshuman Bezbaruah	VRT0090PIUS	8352
60429 7590 11/08/2007 CAMPBELL STEPHENSON LLP 11401 CENTURY OAKS TERRACE BLDG. H, SUITE 250 AUSTIN, TX 78758			EXAMINER CYGIEL, GARY W	
			ART UNIT 2188	PAPER NUMBER
			MAIL DATE 11/08/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

11

Office Action Summary	Application No. 10/728,027	Applicant(s) BEZBARUAH ET AL.	
	Examiner Gary W. Cygiel	Art Unit 2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 18-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 18-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 26 September 2007 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 10/610139 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 10-12 rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The following is taken from the applicant's specification [¶0107]:

"It will be understood by those within the art that each block diagram component, flowchart step, operation and/or component illustrated by the use of examples can be implemented, individually and/or collectively, by a wide range of hardware, software, firmware, or any combination thereof."

The system of claims 10-12 can reasonably be interpreted to be software and as such is not patent eligible subject matter.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-12 and 18-25 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Gabber et al. (US PGPub 2003/0145179 A1) in view of Duprey et al.

(US Patent No. 6,671,705).

Consider **Claims 1,10,18, and 23**,

Gabber teaches a method/system comprising:

a processor for executing instructions (Gabber:Fig 1:Item 103, host computer),

and

a memory to store the instructions (Gabber:Fig 1:Item 103, host computer),

wherein the instructions comprise

identifying instructions to identify a plurality of secondary nodes, wherein

said identifying comprises sending an update to said plurality of nodes

(Gabber:Fig 2:Item 203, system identifies storage elements (secondary nodes)).

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Gabber does not explicitly disclose using a log to maintain updates and further sending a notification associated with the log.

Duprey does teach these elements, including:

wherein at least one secondary node of the plurality of secondary nodes inserts the update in a respective log of updates, and each respective log of updates corresponds to a respective copy of the data (Duprey:Col 6:Lines 35-43 explain that each logical unit is associated with a storage processor (SP) and further Col 6:Lines 62-67 each SP maintains a write cache. Col 7:Lines 1-29 detail that the write log is maintained on both SP's to protect against failure. The write intent log is a log of updates and the two SPs are considered a plurality of secondary nodes.); and

sending instructions to send a notification to each of the plurality of secondary nodes once all of the plurality of secondary nodes have acknowledged the update (Duprey:Col 9 details the status changes that the mirrors go through whenever writes take place. This information is contained on each mirror Col 10:Lines 53-64. These state updates (notifications) are sent as each mirror changes state including a final update after the last mirror has acknowledged the update. Col 12:Lines 39-59 detail that the master needs to acknowledge the update otherwise the status is set to UNREACHABLE.).

Gabber and Duprey are related art solving similar problems such that they are both directed towards improvements in back-up system design through multiple remote mirrors/copies.

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It would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement the steps as taught by Duprey in the system of Gabber because keeping track of the updates and notifying each mirror of the status of the other mirrors provides an exceptionally robust fail-over system in comparison to Gabber alone.

Consider **Claims 2,11,19 and 24**,

The combination of Gabber and Duprey teaches the method/system of claim 2 wherein the instructions further comprise: clearing instructions to clear the update from the respective log of updates in response to receiving the notification (Duprey:Col 6:Lines 35-43, each LU is owned and accessed by only one SP. Col 15:Line 79-Col 16:Line 46, logic is free to remove write entry from write intent log after the update and after testing to ensure no mirrors need the update which occurs after or in response to the notification being sent indicating all mirrors are synchronized.).

Consider **Claims 3 and 20**,

The combination of Gabber and Duprey teaches the method/system of claim 2 wherein clearing the update from the respective log comprises updating a start-of-log pointer in the respective log (Gabber ¶0025 describes using a queue with pointers for each storage element. Further described is that messages are taken off the queue (cleared) and sends them to the storage element. This requires updating the pointers in each queue whatever the title of the pointer may be.).

Consider **Claims 4 and 21**,

The combination of Gabber and Duprey teaches the method/system of claim 2 wherein the clearing the update from the respective log comprises updating a pointer to a location in the respective log, wherein the pointer points to the location if the location contains a next update to clear (As described above, the pointer is updated when it is taken from the queue therefore it was pointing at the next update just prior to it being cleared.).

Consider **Claims 5,12,22, and 25**,

The combination of Gabber and Duprey teaches the method/system of claim 23 wherein the instructions further comprise

determining instructions to determine that a location of a next update in a first respective log of updates to a first respective copy of the data at a first secondary node of the secondary nodes differs from a corresponding location of the next update in a second respective log of updates to a second respective copy of the data at a second secondary node of the secondary nodes (Gabber ¶0024, a determination is made as to whether a particular storage element has up to date data.); and

second identifying instructions to identify a set of updates in the first respective log, wherein each update of the set of updates is not in the second respective log (Gabber:Fig 6:Item 610, getting missed information requires identifying and defining

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updates which are present in the ACTIVE storage element and not present in the second storage element.); and

synchronizing instructions to synchronize the first respective copy and the second respective copy by applying the set of updates to the second respective copy (Gabber ¶0024, if it is determined that a storage element is not up to date then it is instructed to recover from another storage element. Gabber:Fig 6:Item 610, getting missed information is the same as applying the set of updates that differ between the first and second storage elements.).

Consider **Claim 6**,

The combination of Gabber and Duprey teaches the method of claim 1 wherein the determining occurs when a primary node maintaining the data fails (Gabber ¶0028-0030 describes a system which allows for failure and swaps to a second host element to act as the primary. The determining occurs at all times including when a primary node fails.).

Consider **Claim 7**,

The combination of Gabber and Duprey teaches the method of claim 1 further comprising: setting a sent indicator for the update for one of the plurality of secondary nodes when the update is sent to the one secondary node (Duprey:Col 11:Line 63-Col 12:Line 30, describes that image data contains a mirror image state which acts as an

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indicator indicating sent status of updates (i.e. synchronized, unsynchronized and synchronizing)).

Consider **Claim 8**,

The combination of Gabber and Duprey teaches the method of claim 7 further comprising: setting a received indicator for the update for the one secondary node when an acknowledgement of the update is received from the one secondary node (Duprey:Col 11:Line 63-Col 12:Line 30, describes that image data contains a mirror image state which acts as an indicator indicating received status of updates (i.e. synchronized, unsynchronized and synchronizing)).

Consider **Claim 9**,

The combination of Gabber and Duprey teaches the method of claim 8 wherein the sending the notification to each of the plurality of secondary nodes comprises determining that a respective sent indicator and a respective received indicator for the update are set for each of the plurality of secondary nodes (Duprey:Col 9 details the status changes that the mirrors go through whenever writes take place. This information is contained on each mirror Col 10:Lines 53-64. These state updates (notifications) are sent as each mirror changes state including a final update after the last mirror has acknowledged the update. Since the update includes the status (i.e. synchronized, unsynchronized and synchronizing) the status of the state (sent/received indicator) must be determined when sending the notification.).

Response to Arguments

5. Applicant's arguments filed 26 September 2007 have been fully considered but they are not persuasive.

[A] Re: Double Patenting

The double patenting rejections have been withdrawn in view of the terminal disclaimer submitted on 26 September 2007.

[B] Re: Means for language is inherently statutory.

The examiner respectfully disagrees and is unaware of any requirement that would make "means for" language inherently statutory. The specification clearly recites that the "means for" could be software implemented. The rejection is maintained for the reasons cited in this and the original action.

[C] Re: Gabber does not teach identifying a plurality of secondary nodes.

If a request is sent to all connected storage elements (Item 205) then these storage elements must have previously identified. The system determines (identifies) these storage elements (Item 203) prior to sending the request.

[D] Re: A request is not analogous to an update.

Applicants representative accurately states (Remarks:Page 11) that the requests in Gabber comprise reads and writes. A write is necessarily an update and therefore a request is clearly analogous to an update.

[E] Re: A plurality of secondary nodes is different from all secondary nodes.

Applicants representative correctly states (Remarks:Page 13) that "the plurality of secondary nodes need not include all of the secondary nodes." This however does not support the argument that the plurality of secondary nodes can not include all of the secondary nodes.

[F] Re: Duprey and Gabber are incompatible.

The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

The examiner has never suggested that the entire system of Duprey and the entire system of Gabber be completely reassembled and engineered such that every feature is present in the combination. Duprey was relied upon because he teaches some well-known elements used in back-up systems. The teachings relied upon in Duprey are in no way revolutionary and would have been readily available to a person of even basic skill in the art at the time the invention was made.

[G] Re: Duprey's SP are not analogous to the plurality of secondary nodes.

Gabber is the primary reference relied upon to teach a plurality of secondary nodes. The combination of Gabber and Duprey includes a plurality of nodes.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections

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are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

[H] Re: Duprey fails to recite anything that even comes close to maintaining a separate update log for each update limitation of claim 1.

The examiner is not aware of this limitation being in independent claim 1. Claim 1 only recites that a respective log of updates corresponds to a respective copy of the data.

[I] Re: Duprey fails to teach sending a notification to each of the plurality of secondary nodes once all of the pluralities of secondary nodes have acknowledged the update.

This limitation was clearly addressed in this and the prior action. State updates (notifications) are sent as each mirror changes state including a final update after the last mirror has acknowledged the update. Therefore, after (once) all the mirrors have been updated, all the mirrors receive a status update (notification).

[J] Re: Attacks on the number of elements recited by Duprey.

Applicant is kindly reminded that Duprey is relied upon as a secondary reference and used solely to show elements that are well known in the art. The number of elements taught by Duprey alone is irrelevant since it is the combination of Gabber and Duprey that are relied upon to teach the limitations of the claims.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary W. Cygiel whose telephone number is (571)270-1170. The examiner can normally be reached on Monday through Thursdays 12:00pm-2:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on (571)272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

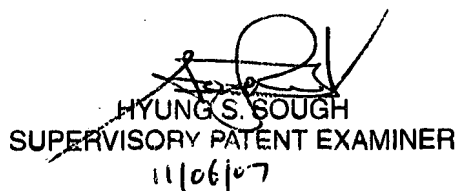
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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Gary W Cygier
Examiner
Art Unit 2188

GWC 11/1/2007



HYUNG S. SOUGH
SUPERVISORY PATENT EXAMINER
11/06/07